



What is claimed is:

1. A lead-free solder consisting essentially of:

- (a) 1.0 to 4.0 wt% of Ag;
- 5 (b) 0.4 to 1.3 wt% of Cu;
- (c) 0.02 to 0.06 wt% of Ni; and
- (d) a balance of Sn;

wherein said Ni serves to lower a copper dissolution rate of said solder.

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2. The solder according to claim 1, wherein a content of Ni is in a range from 0.02 to 0.04 wt%.

(Amended)

3. The solder according to claim 1, wherein said solder [having] a^{has}
15 copper dissolution rate of 0.20^{μm/sec} [μm] or less.

(Amended)

4. The solder according to claim 1, wherein said solder [having] a^{has}
liquidus temperature of 240°C or lower.

(Amended)

20 5. The solder according to claim 1, wherein said solder [having] a^{has}
liquidus temperature of 230°C or lower.

6. The solder according to claim 1, wherein said solder has a

viscosity of 2.5 cP or lower.

7. The solder according to claim 1, further containing 0.02 to 0.06 wt% of Fe.

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8. The solder according to claim 1, further containing 0.02 to 0.05 wt% of Fe.

9. A lead-free solder consisting essentially of:

- 10 (a) 1.0 to 4.0 wt% of Ag;
(b) 0.4 to 1.3 wt% of Cu;
(c) 0.02 to 0.06 wt% of Fe; and
(d) a balance of Sn;

wherein said Fe serves to lower a copper dissolution rate
15 of said solder.

10. The solder according to claim 9, wherein a content of Fe is in a range from 0.02 to 0.05 wt%.

(Amended)
20 11. The solder according to claim 9, wherein said solder ^{has} [having] ^{μm/SEC} a copper dissolution rate of 0.20 [μm] or less.

(Amended)
12. The solder according to claim 9, wherein said solder ^{has} [having] ^{HA}

a liquidus temperature of 240°C or lower.

13. ^(amended) The solder according to claim 9, wherein said solder ~~having~~ ^{has}

a liquidus temperature of 230°C or lower.

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14. The solder according to claim 9, wherein said solder has a viscosity of 2.5 cP or lower.

15. A method of surface-treating a PWD, comprising the steps of:

- 10 (a) preparing said solder according to claim 1; and
(b) selectively coating said solder on a Cu circuit layer of a PWB.

16. A method of surface-treating a PWD, comprising the steps of:

- 15 (a) preparing said solder according to claim 7; and
(b) selectively coating said solder on a Cu circuit layer of a PWB.

17. A method of surface-treating a PWD, comprising the steps of:

- 20 (a) preparing said solder according to claim 9; and
(b) selectively coating said solder on a Cu circuit layer of a PWB.

to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. [2].

Examiner Note:

1. In bracket 2, insert an explanation of what is in the claim and why it does not constitute a further limitation.
2. Note *Ex parte Porter*, 25 USPQ2d 1144 (Bd. Pat. App. & Inter. 1992) for situations where a method claim is considered to be properly dependent upon a parent apparatus claim and should not be objected to or rejected under 35 U.S.C. 112, fourth paragraph. See also MPEP § 608.01(n), "Infringement Test" for dependent claims. The test for a proper dependent claim is whether the dependent claim includes every limitation of the parent claim. The test is not whether the claims differ in scope. A proper dependent claim shall not conceivably be infringed by anything which would not also infringe the basic claim.

III. INFRINGEMENT TEST

The test as to whether a claim is a proper dependent claim is that it shall include every limitation of the claim from which it depends (35 U.S.C. 112, fourth paragraph) or in other words that it shall not conceivably be infringed by anything which would not also infringe the basic claim.

A dependent claim does not lack compliance with 35 U.S.C. 112, fourth paragraph, simply because there is a question as to (1) the significance of the further limitation added by the dependent claim, or (2) whether the further limitation in fact changes the scope of the dependent claim from that of the claim from which it depends. The test for a proper dependent claim under the fourth paragraph of 35 U.S.C. 112 is whether the dependent claim includes every limitation of the claim from which it depends. The test is not one of whether the claims differ in scope.

Thus, for example, if claim 1 recites the combination of elements A, B, C, and D, a claim reciting the structure of claim 1 in which D was omitted or replaced by E would not be a proper dependent claim, even though it placed further limitations on the remaining elements or added still other elements.

Examiners are reminded that a dependent claim is directed to a combination including everything recited in the base claim and what is recited in the dependent claim. It is this combination that must be compared with the prior art, exactly as if it were presented as one independent claim.

The fact that a dependent claim which is otherwise proper might relate to a separate invention which would require a separate search or be separately classified from the claim on which it depends would not render it an improper dependent claim, although it might result in a requirement for restriction.

The fact that the independent and dependent claims are in different statutory classes does not, in itself, render the latter improper. Thus, if claim 1 recites a specific product, a claim for the method of making the product of claim 1 in a

particular manner would be a proper dependent claim since it could not be infringed without infringing claim 1. Similarly, if claim 1 recites a method of making a product, a claim for a product made by the method of claim 1 could be a proper dependent claim. On the other hand, if claim 1 recites a method of making a specified product, a claim to the product set forth in claim 1 would not be a proper dependent claim if the product might be made in other ways.

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IV. CLAIM FORM AND ARRANGEMENT

A singular dependent claim 2 could read as follows:

2. The product of claim 1 in which

A series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim.

A claim which depends from a *dependent* claim should not be separated therefrom by any claim which does not also depend from said "dependent claim." It should be kept in mind that a dependent claim may refer back to any preceding independent claim. These are the only restrictions with respect to the sequence of claims and, in general, applicant's sequence should not be changed. See MPEP § 608.01(j). Applicant may be so advised by using Form Paragraph 6.18.

¶ 6.18 Series of Singular Dependent Claims

A series of singular dependent claims is permissible in which a dependent claim refers to a preceding claim which, in turn, refers to another preceding claim.

A claim which depends from a dependent claim should not be separated by any claim which does not also depend from said dependent claim. It should be kept in mind that a dependent claim may refer to any preceding independent claim. In general, applicant's sequence will not be changed. See MPEP § 608.01(n).

During prosecution, the order of claims may change and be in conflict with the requirement that dependent claims refer to a preceding claim. Accordingly, the numbering of dependent claims and the numbers of preceding claims referred to in dependent claims should be carefully checked when claims are renumbered upon allowance.

V. REJECTION AND OBJECTION

If the base claim has been canceled, a claim which is directly or indirectly dependent thereon should be rejected as incomplete. If the base claim is rejected, the dependent claim should be objected to rather than rejected, if it is otherwise allowable.